

-8-

Remarks

This application has been reviewed in light of the Final Office Action of March 7, 2007. Claims 1-26 are pending, and all claims are rejected. In response, the following remarks are submitted. Reconsideration of this application is requested.

**Ground 1.** Claims 1, 2, 4-7, 9, 11, 12, and 14-23 are rejected under 35 USC 102 as anticipated by JP 57-164958 (JP '958). Applicant traverses this ground of rejection.

The following principle of law applies to §102 rejections. MPEP 2131 provides: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the ... claim. The elements must be arranged as required by the claim..." [citations omitted] This is in accord with the decisions of the courts. Anticipation under §102 requires 'the presence in a single prior art disclosure of all elements of a claimed invention arranged as in that claim.' Carella v. Starlight Archery, 231 USPQ 644, 646 (Fed. Cir., 1986), quoting Panduit Corporation v. Dennison Manufacturing Corp., 227 USPQ 337, 350 (Fed. Cir., 1985).

Thus, identifying a single element of the claim, which is not disclosed in the reference, is sufficient to overcome a §102 rejection.

Claim 1 recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology." [emphasis added]

Claim 14 recites in part:

"post-processing the consolidated metallic article by heat treating the consolidated metallic article to form a martensitic article, wherein ~~the martensitic article includes a body-centered cubic phase or a body-centered tetragonal matrix phase, and wherein at least about 75 percent by volume of the body-centered cubic phase or the body-centered tetragonal matrix phase is present in an acicular phase morphology.~~"

JP '958 has no such disclosure. The reference does not teach body-centered cubic or body-centered tetragonal crystal structures and does not teach an acicular phase morphology, nor does it disclose that "at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal matrix phase is present in an acicular phase morphology." JP '958 does not disclose the recited approach of claim 1 or claim 14.

The explanation of the rejection in the prior Office Action discussed and relied upon Example 1 of JP '958. Example 1 produced a material, which is illustrated in Figures 1-2 of JP '958. JP '958 does not suggest that the resulting structure is martensitic, and the resulting structure shown in Figures 1-2 is not acicular. JP '958 does not teach that the resulting structure is acicular or the other recited limitations.

There is an assertion that the structure produced by JP '958 would inherently have the recited microstructure (Final Office Action, page 2, 1-4 lines from bottom of page). As noted in the prior paragraph, Figures 1-2 of JP '958, which depict the structure resulting from Example 1 of JP '958, do not evidence the recited acicular microstructure. Nor is there any discussion suggesting that the approach of JP '958 results in the other recited features of claims 1 and 14.

But since the assertion of inherency is maintained contrary to the evidence of Figure 1 of JP 958, it is necessary to formally challenge that assertion. MPEP 2112-2113 sets forth the law on inherency. Inherency should only be asserted if there is evidence to suggest that the asserted property or characteristic is necessarily present in the teachings of the prior art reference. The concept of inherency is not provided as a way to fill in the gaps in missing disclosure or teachings based upon speculation, unless the asserted property or characteristic may be shown to be necessarily present by objective evidence. "Inherency" is used when every aspect of the disclosure of a reference and the claimed subject matter are otherwise exactly the same, then it may be inferred that some property or characteristic further recited in the claim must necessarily be present in the art reference. MPEP 2112 provides "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or

characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993); In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted). "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)."

If these rejections are maintained, Applicant asks that the Examiner provide the basis in fact or technical reasoning for the claim of inherency. Applicant does not see how this will be possible in light of the absence of an acicular microstructure, wherein the structure of JP '958 is shown in Figures 1-2 of JP '958.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 2.** Claims 13 and 24-26 are rejected under 35 USC 102 as anticipated by JP '958. Applicant traverses this ground of rejection.

Claims 13, 24, and 25 depend from claim 1 and respectively incorporate its limitations. The limitations of claim 1 are not disclosed by JP '958, and therefore the limitations of claims 13, 24, and 25 cannot be disclosed by JP '958.

Claim 26 recites in part:

"providing a chemically reducible nonmetallic alloying-element precursor compound of an alloying element, wherein the alloying element is thermophysically melt incompatible with the iron base metal and is selected from the group consisting of barium, calcium, cadmium, cerium, lithium, magnesium, manganese, zinc, aluminum, arsenic, copper, hafnium, lanthanum, tin, boron, gadolinium, rhenium, phosphorus, silicon, thorium, yttrium, zirconium, oxygen, sulfur, silver, indium, beryllium, antimony, and scandium;"

-11-

The explanation of the rejection relies on the presence of manganese in this recitation and the mention of manganese in JP '958. JP '958 does not disclose the presence of a precursor compound of manganese as claim 26 recites. Only metallic manganese is disclosed to be present as an impurity in  $\text{Fe}_2\text{O}_3$  (Translation of JP '958, page 16, lines 4-5). Claim 26 recites the presence of a precursor compound of a thermophysically melt incompatible element, with manganese being one such element.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 3.** Claim 8 is rejected under 35 USC 103 over JP '958 in view of Fray (WO 99/64638 or U.S. Patent 6,712,952). Applicant traverses this ground of rejection.

MPEP 2142, under ESTABLISHING A PRIMA FACIE CASE OF OBVIOUSNESS, provides: "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. [citations omitted]. See MPEP para. 2143-2143.03 for decisions pertinent to each of these criteria."

First requirement--there must be an objective basis for combining the teachings of the references

The first of the requirements of MPEP 2142 is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings." The present rejection is a §103 combination rejection. To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. MPEP 2142, 2143 and 2143.01. See also, for example, In re Fine, 5 USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), In re Laskowski, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 311-313 (Fed. Cir., 1983), and Ex parte

Levengood, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351 (Board of Appeals 1984). As stated in In re Fine at 5 USPQ2d 1598:

"The PTO has the burden under §103 to establish a prima facie case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the examiner must provide such an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown in order to extract specific teachings from the individual references:

"Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)."

\* \* \* \* \*

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)."

\* \* \* \* \*

"A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach

that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. Ex parte Levengood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)."

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. In this case, there is no objective basis set forth in the Office Action. An advantage claimed by Fray is disclosed, but that is not a reason to combine the teachings of Fray with those of JP '958. Fray's advantages are not relative and would be ineffective in the approach disclosed by JP '958 for iron-base alloys.

If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining the teachings of the references, and for adopting only the helpful teachings of each reference and disregarding the unhelpful teachings of the reference. Thus, as it stands now, the invention as a whole is not prima facie obvious over the combined teachings of the prior art.

Second requirement--there must be  
an expectation of success

The second of the requirements of MPEP 2142 is an expectation of success. There is no expectation of success...This requirement has not been addressed in the explanation of the rejection, and in any event more than Examiner's argument is required here.

As stated in MPEP 2142, "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. [citations omitted]."

Nothing in either reference suggests that the approach of Fray would be operable and successful with the iron-base alloys disclosed by JP '958. If the rejection is maintained, Applicant asks that the Examiner indicate the language in either reference that suggests that Fray's approach could be used with the iron-base alloys of JP '958.

Third requirement--the prior art  
must teach the claim limitations

The third of the requirements of MPEP 2142 is that “the prior art reference (or references when combined) must teach or suggest all the claim limitations.” In this regard, the following principle of law applies to all §103 rejections. MPEP 2143.03 provides “To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).” [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Claim 8 incorporates the limitations of claim 1, which are not taught by JP '958 for the reasons stated earlier and which are incorporated here. Fray adds nothing in this regard.

Claim 8 further recites in part:

“the step of chemically reducing includes the step of  
chemically reducing the compound mixture by fused salt electrolysis”

The “compound mixture” is that recited in claim 1:

“providing a chemically reducible nonmetallic base-metal precursor compound of the iron base metal;

providing a chemically reducible nonmetallic alloying-element precursor compound of an alloying element, wherein the alloying element is thermophysically melt incompatible with the iron base metal; thereafter

mixing the base-metal precursor compound and the alloying-element precursor compound to form a compound mixture”

Neither reference teaches that a “compound mixture” having an iron base-metal precursor may be chemically reduced by fused salt electrolysis.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 4.** Claims 3 and 10 are rejected under 35 USC 103 over JP '958 in view of Armstrong U.S. Patent 5,958,106 (Armstrong '106). Applicant traverses this ground of rejection.

Applicant incorporates the discussion of the Ground 1-Ground 3 rejections.

This is a §103 combination rejection, and must meet the requirements set forth under Ground 3.

First requirement--there must be an objective basis for combining the teachings of the references

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. In this case, there is no objective basis set forth in the Office Action. An advantage claimed by Armstrong is disclosed, but that is not a reason to combine the teachings of Armstrong with those of JP '958. JP '958 already discloses an approach for performing its process on iron-base alloys, and there is no reason to substitute Armstrong's approach for that of JP '958. Armstrong's stated advantages are stated relative to the prior approach, not relative to the approach disclosed by JP '958 for iron-base alloys.

If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining the teachings of the references, and for adopting only the helpful teachings of each reference and disregarding the unhelpful teachings of the reference. Thus, as it stands now, the invention as a whole is not prima facie obvious over the combined teachings of the prior art.

Second requirement--there must be an expectation of success

Nothing in either reference suggests that the approach of Armstrong would be operable and successful with the iron-base alloys disclosed by JP '958. If the rejection is maintained, Applicant asks that the Examiner indicate the language in either reference that suggests that Frey's approach could be used with the iron-base alloys of JP '958.

Third requirement--the prior art  
must teach the claim limitations

Claim 3 incorporates the limitations of claim 1, which are not taught by JP '958 for the reasons stated earlier and which are incorporated here. Armstrong adds nothing in this regard.

Claim 3 further recites in part:

"...the step of providing the chemically reducible nonmetallic base-metal precursor compound includes the step of  
providing the chemically reducible nonmetallic base-metal precursor compound in a gaseous form,"

Neither reference suggests that a precursor compound for iron, the base metal, may be provided in gaseous form.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 5.** Claims 1-4 and 6-9 are rejected on the doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 5, 11, 12, and 13 of Shambien U.S. Patent 6,926,754. Applicant traverses this ground of rejection.

MPEP 804 discusses the basis for the obviousness-type double patenting rejection. As set forth there,

"In determining whether a nonstatutory basis exists for a double patenting rejection, the first question to be asked is--does any claim in the application define an invention that is merely an obvious variation of an invention claimed in the patent? If the answer is yes, then an 'obviousness-type' nonstatutory double patenting rejection may be appropriate. Obviousness-type double patenting requires rejection of an application claim when the claimed subject matter is not patentably distinct from the subject matter claimed in a commonly owned patent when the issuance of a second patent would provide unjustified extension of the term of the right to exclude granted by a patent. [citations omitted]

"A double patenting rejection of the obviousness-type is 'analogous to [a failure to meet] the nonobviousness requirement of 35 USC 103' except that the patent principally underlying the double patenting rejection is not considered prior art. [citation omitted] Therefore, any analysis employed in an obviousness-type double patenting rejection parallels the guidelines for analysis of a 35 USC 103 obviousness determination. [citations omitted]."

Following this approach, the following principle of law applies to all §103 and obviousness-type double patenting rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art, in this case the claims of the patent underlying the double patenting rejection. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art, in this case the claims of the patent underlying the double patenting rejection. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art, or in this case the claims of the patent underlying the double patenting rejection. If limitations are not found in any of the applied prior art, in this case the claims of the patent underlying the double patenting rejection, the rejection cannot stand. In this case, the claims of the patent underlying the double patenting rejection clearly do not arguably teach some limitations of the claims.

The present claim 1 recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology."

The claims of Shamblen '754 have no such teaching. The claims of Shamblen '754 have no teaching that its approach may be used with a martensitic-composition steel. In its most favorable interpretation to the rejection, Shamblen '754 expressly limits his claimed

invention to superalloys (col. 16, line 20) made of precursors of iron-base metals (col. 16, line 10), but makes no mention of the materials and limitations recited in claim 1 and quoted above. Claims 2-4 and 6-9 depend from claim 1 and incorporate this same limitation. Accordingly, none of claims 1-4 and 6-9 is an obvious variation of the claims of Shamblen '754.

The Examiner's position is that the recitation of "iron-base" in Shamblen is sufficient to teach the limitation of claim 1, "a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology." That is not correct. The present claim 1 recites a far narrower class of alloys.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 6.** Claims 14-20 are rejected under on the doctrine of obviousness-type double patenting over claims 1 and 14-19 of Shamblen '754. Applicant traverses this ground of rejection.

Applicant notes that the UOC reference was dropped from this ground of rejection in the present Office Action. Applicant does not know whether this was intentional or not, but Applicant can respond only to the rejection as stated.

This obviousness-type double patenting rejection must be analyzed in the same manner as any §103 combination rejection, *see* the discussion under the Ground 5 rejection. The requirements for such a rejection were discussed above, and are incorporated here. The discussion of the first and second requirements is incorporated from the discussion of the Ground 5 rejection.

Third requirement--the prior art must teach the claim limitations

Claim 14 recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated

metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel; and

post-processing the consolidated metallic article by heat treating the consolidated metallic article to form a martensitic article, wherein the martensitic article includes a body-centered cubic phase or a body-centered tetragonal matrix phase, and wherein at least about 75 percent by volume of the body-centered cubic phase or the body-centered tetragonal matrix phase is present in an acicular phase morphology.”

The explanation of the rejection references the explanation of the corresponding rejection in the Office Action of October 19, 2006. The corresponding rejection discussed in the paragraph bridging pages 8-9 of the Office Action of October 19, 2006, admits that Shamblen has no such teaching, and previously relied on the UOC reference. The UOC reference has been omitted from the present rejection. Shamblen’s claims do not teach the limitations of claims 14 and 15-20. Applicant request clarification with respect to the rejection of claims 14-20, particularly with respect to the application/nonapplication of the UOC reference.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 7.** Claims 5, 11, and 12 are rejected on the doctrine of obviousness-type double patenting over claim 1 of Shamblen ‘754 in view of JP ‘958. Applicant traverses this ground of rejection.

This obviousness-type double patenting rejection must be analyzed in the same manner as any §103 combination rejection. The requirements for such a rejection were discussed above, and are incorporated here.

First requirement--there must be an objective basis for combining the teachings of the references

Claim 1 of Shamblen ‘754 teaches that the mixture is chemically reduced “to produce an iron-base alloy” (in the reading most favorable to the rejection, at col. 16, lines 19-20) that results in a metallic superalloy (col. 16, line 20). JP ‘958 deals with martensitic steels. There is no reason to believe that Shamblen ‘754 could be used to make martensitic steels or martensitic-steel compositions, which are not iron-base superalloys. The

explanation of the rejection gives no basis for combining the teachings of these two references.

Second requirement--there must be  
an expectation of success

There is nothing in either reference to suggest that Shamblen's approach may be used to prepare martensitic steels. If the rejection is maintained, Applicant asks that the Examiner provide an objective basis for an assertion of success in the combination.

Third requirement--the prior art  
must teach the claim limitations

Claim 1 recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology."

Neither reference has such a teaching as to the nature of the martensitic article.  
Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 8.** Claim 10 is rejected on the doctrine of obviousness-type double patenting over claim 1 of Shamblen '754 in view of JP '958 and further in view of Armstrong '106. Applicant traverses this ground of rejection.

Applicant incorporates the prior discussions of the grounds of rejection, and particularly the rejections of Ground 4 and Ground 7.

First requirement--there must be an objective

basis for combining the teachings of the references

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. In this case, there is no objective basis set forth in the Office Action. An advantage claimed by Armstrong is disclosed, but that is not a reason to combine the teachings of Armstrong with those of JP '958. JP '958 already discloses an approach for performing its process on iron-base alloys, and there is no reason to substitute Armstrong's approach for that of JP '958. Armstrong's stated advantages are stated relative to the prior approach, not relative to the approach disclosed by JP '958 for iron-base alloys.

Claim 1 of Shamblen '754 teaches that the mixture is chemically reduced to produce a metallic superalloy (claim 16, line 20) from a precursor of an iron-base alloy (in the reading most favorable to the rejection, see col. 16, line 10). JP '958 deals with martensitic steels. There is nothing in either reference to suggest that the approach of Shamblen '754 may be used to produce martensitic steels or martensitic-steel compositions, which are not superalloys. The explanation of the rejection gives no basis for combining the teachings of these two references.

If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining the teachings of the references, and for adopting only the helpful teachings of each reference and disregarding the unhelpful teachings of the reference. Thus, as it stands now, the invention as a whole is not prima facie obvious over the combined teachings of the prior art.

Second requirement--there must be  
an expectation of success

There is nothing in either reference to suggest that Shamblen's approach may be used to prepare martensitic steels. If the rejection is maintained, Applicant asks that the Examiner provide an objective basis for an assertion of success in the combination.

Nothing in either reference suggests that the approach of Armstrong would be operable and successful with the disclosed by JP '958. If the rejection is maintained, Applicant asks that the Examiner indicate the language in either reference that suggests that Frey's approach could be used with the iron-base alloys of JP '958.

Third requirement--the prior art must teach the claim limitations

Claim 1, from which claim 10 depends, recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology."  
[emphasis added]

None of the references has such a teaching as to the nature of the martensitic article.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 9.** Claims 21-23 are rejected on the doctrine of obviousness-type double patenting over claim 1 of Shamblen '754 in view of University of Cambridge (UOC), "Martensite and Martensitic Phase Transformation" internet download and further in view of JP '958. Applicant traverses this ground of rejection.

There is no authentication that the material presented as this UOC "prior art" reference is in fact prior art under 35 USC 103, relative to the March 31, 2004, filing date of the present application. If the rejection is maintained, Applicant asks that the Examiner demonstrate that this reference is in fact prior art to the present claims.

Applicant incorporates the prior discussions of the grounds of rejection, and particularly the rejections of Ground 6 and Ground 7. Claims 21-23 depend from claim 14.

First requirement--there must be an objective basis for combining the teachings of the references

There is no objective basis for combining the teachings of Shamblen and UOC. Shamblen '754 expressly limits his claimed invention "to produce a metallic superalloy" which may be an iron-base superalloy (col. 16, lines 10, 19-20). The invention recited in the claims of Shamblen has no teaching of martensitic steels, and UOC deals only with martensitic steels. The explanation of the rejection argues that "it would be obvious...to heat-treat the consolidated iron based metallic article in claim 1 of '754 B2 in order to form a martensitic steel..." There is nothing at all in claim 1 of '754 to suggest that Shamblen's approach may be used to prepare a martensitic steel. Nor is there anything in UOC to suggest that its martensitic steel may be made by an approach like that of Shamblen. There is no objective basis for combining the teachings of these two references. If the rejection is maintained, Applicant asks that the Examiner provide an objective basis for the combining of the teachings of the two references.

Second requirement--there must be  
an expectation of success

There is nothing in either reference to suggest that Shamblen's approach may be used to prepare martensitic steels, and nothing in UOC to suggest that martensitic steels may be produced by the approach of Shamblen. If the rejection is maintained, Applicant asks that the Examiner provide an objective basis for an assertion of success in the combination.

Third requirement--the prior art  
must teach the claim limitations

The rejected claims, in their dependence from claim 14, each recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel; and

post-processing the consolidated metallic article by heat treating the consolidated metallic article to form a martensitic article, wherein the martensitic article includes a body-centered cubic phase or a body-centered

tetragonal matrix phase, and wherein at least about 75 percent by volume of the body-centered cubic phase or the body-centered tetragonal matrix phase is present in an acicular phase morphology."

The references have no such teaching. Neither reference teaches making a martensitic-composition steel without melting the metallic alloy and without melting the consolidated metallic article, where the martensitic article is defined in the manner recited in the above-quoted excerpt from claim 14. That UOC mentions martensite does not meet this limitation, which is much more specific.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 10.** Claim 13 is rejected on the doctrine of obviousness-type double patenting over claim 1 of Shamblen '754 in view of JP '958.

Applicant incorporates the discussion of the Ground 7 rejection.

First requirement--there must be an objective basis for combining the teachings of the references

Claim 1 of Shamblen '754 teaches that the mixture is chemically reduced "to produce an iron-base alloy" (in the reading most favorable to the rejection, at col. 16, lines 19-20) that results in a metallic superalloy (col. 16, line 20). JP '958 deals with martensitic steels. There is no reason to believe that Shamblen '754 could be used to make martensitic steels or martensitic-steel compositions, which are not iron-base superalloys. The explanation of the rejection gives no basis for combining the teachings of these two references.

Second requirement--there must be an expectation of success

There is nothing in either reference to suggest that Shamblen's approach may be used to prepare martensitic steels. If the rejection is maintained, Applicant asks that the Examiner provide an objective basis for an assertion of success in the combination.

Third requirement--the prior art must teach the claim limitations

Claim 13, through its dependence from claim 1, recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology."  
[emphasis added]

Neither the claims of Shamblen '754 nor JP '958 has such a teaching as to the nature of the martensitic article.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

**Ground 11.** Claims 24-26 are rejected on the doctrine of obviousness-type double patenting as being unpatentable over claim 1 of Shamblen '754 in view of JP '958.

Applicant incorporates the discussion of the Ground 7 rejection.

First requirement--there must be an objective basis for combining the teachings of the references

Claim 1 of Shamblen '754 teaches that the mixture is chemically reduced "to produce an iron-base alloy" (in the reading most favorable to the rejection, at col. 16, lines 19-20) that results in a metallic superalloy (col. 16, line 20). JP '958 deals with martensitic steels. There is no reason to believe that Shamblen '754 could be used to make martensitic steels or martensitic-steel compositions. The explanation of the rejection gives no basis for combining the teachings of these two references.

Second requirement--there must be an expectation of success

There is nothing in either reference to suggest that Shamblen's approach may be used to prepare martensitic steels. If the rejection is maintained, Applicant asks that the Examiner provide an objective basis for an assertion of success in the combination.

Third requirement--the prior art  
must teach the claim limitations

Claims 24-25, through their dependence from claim 1, each recites in part:

"consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology."  
[emphasis added]

Neither the claims of Shamblen '754 nor JP '958 has such a teaching as to the nature of the martensitic article.

Claim 26 recites in part:

"providing a chemically reducible nonmetallic alloying-element precursor compound of an alloying element, wherein the alloying element is thermophysically melt incompatible with the iron base metal and is selected from the group consisting of barium, calcium, cadmium, cerium, lithium, magnesium, manganese, zinc, aluminum, arsenic, copper, hafnium, lanthanum, tin, boron, gadolinium, rhenium, phosphorus, silicon, thorium, yttrium, zirconium, oxygen, sulfur, silver, indium, beryllium, antimony, and scandium;"

Neither the claims of Shamblen nor JP '958 teach precursor compounds of these recited elements. Certainly there is no mention in the claims of Shamblen. The explanation of the rejection relies on the presence of manganese in this recitation and the mention of

manganese in JP '958. JP '958 does not disclose the presence of a precursor compound of manganese as claim 26 recites. Only metallic manganese is disclosed to be present as an impurity in  $\text{Fe}_2\text{O}_3$  (Translation of JP '958, page 16, lines 4-5). Claim 26 recites the presence of a precursor compound of a thermophysically melt incompatible element, with manganese being one such element.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Applicant submits that the application is in condition for allowance, and requests such allowance.

**CONCLUSION**

For at least the reasons set forth above, Applicant respectfully requests reconsideration of the Application and withdrawal of all outstanding objections and rejections. Applicant respectfully submits that the claims are not anticipated by, nor rendered obvious in view of, the cited art either alone or in combination and thus, are in condition for allowance. Thus, Applicant requests allowance of all pending claims in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant's undersigned representative.

This Response has been filed within three (3) months of the mailing date of the Final Office Action and it is believed that no fees are due with the filing of this paper. In the event that Applicant is mistaken in these calculations, applicant requests any extension of time that may be necessary and the Commissioner is hereby authorized to deduct any fees determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

Dated: May 17, 2007

Respectfully submitted,  
McNees Wallace & Nurick LLC

Phone: (717) 237-5281  
Fax: (717) 237-5300

/Andrew L. Oltmans/  
Andrew L. Oltmans  
Reg. No. 56,074  
100 Pine Street  
P.O. Box 1166  
Harrisburg, PA 17108-1166  
Attorney for Applicant